FRIDAY FLYER – AUGUST 3, 2012

Something to share: an interesting research project or kudos for a student, teacher or mentor? Contact Kris Whelan.

CENTER SPOTLIGHT: University of California-Santa Cruz - http://scipp.ucsc.edu/outreach/

Contact Steve Ritz or Vicki Johnson for more information about SCIPP QuarkNet programs.

The Santa Cruz Institute for Particle Physics (SCIPP) at UCSC is one of our original twelve centers, joining QuarkNet in 1999. Teachers have gained firsthand knowledge of the Fermi Gamma-ray Space Telescope from the physicists involved in that program. Formerly referred to as the Gamma-ray Large Area Space Telescope (GLAST), Fermi is a space observatory for particle physics and high-energy astrophysics. Several of the teachers were able to attend the launch of this telescope in 2008. There are three main QuarkNet activities at SCIPP: Balloon Fest, high school student internships, and the teacher workshop. The annual Balloon Fest brings students together with QuarkNet teachers and mentors. Student groups design and deploy experiments using weather balloons and present their results to the other students and UCSC physicists. One group launched a redesigned version of a cosmic ray detector in an attempt to study flux variations. UCSC has a very strong student research component. Using funds from QuarkNet and SCIPP, UCSC has been able to support an average of eight students each summer for a four-week intensive internship. This summer, nine students worked on advanced cosmic ray detector projects. A regular feature of the program is a set of 8-10 highly interactive and in-depth discussions with leading SCIPP scientists on their frontier research. Finally, the annual one-week teacher workshop, which overlaps with the final week of the high school student internship, brings area teachers to SCIPP for a week of detector and related projects, with an emphasis on experiences and ideas useful for the classroom.

NEWS FROM QUARKNET CENTRAL Mind your P's and DAQ's Did you know the QuarkNet data acquisition card (DAQ) has been around since 2001, when QuarkNet was only two years old? The very first version did not have some of the features you use today. It did only the basic functions like digitizing input signals, timing the signals and providing a user-defined trigger multiplicity across four inputs. Version 2.0 added the ability to use timing and geographic location information from GPS satellites and a calibrated barometric pressure sensor. DAQ Version 2.5 replaced the custom timing chip with a commercial chip, introduced a voltage controlled frequency oscillator (for frequency reference) and changed out the manually adjustable trimpots for an ADC chip. Version 2.5 also changed the computer interface to be a higher speed USB cable connection and upgraded the GPS receiver. With a few additional minor changes, the current DAQ is Version 2.54. The DAQ firmware, Version 1.12, has kept pace with the changes. We named the current version of the DAQ our "Series 6000 model," as the serial number on each board indicates. The DAQ circuit boards and the GPS module boards are manufactured in the Chicago area using a hardware design created by Fermilab engineers and other QuarkNet contributors. Our DAQ is truly a state-of-the-art timing circuit board, thanks to these professionals.

PHYSICS EXPERIMENT ROUNDUP Higgs boson results from LHC "get even stronger" http://www.bbc.co.uk/news/science-environment-19076355 When the Higg's boson discovery was announced, both the ATLAS and CMS spokespersons said that they needed much more data for confirmation and clarification. Further study of the data has revealed even stronger results defining the properties of a Higgs. "Now one Higgs-hunting team at the Large Hadron Collider reports '5.9 sigma' levels of certainty it exists. That equates to a one-in-550 million chance that the Higgs does not exist and the results are statistical flukes." - from BBC News

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